

REMARKS

The Office Action dated May 3, 2005, has been carefully reviewed and the foregoing amendment and following remarks are made in consequence thereof.

Claims 1-31 are pending in this application. Claims 1-31 stand rejected.

The objection to the abstract because it fails to adequately describe the invention is respectfully traversed. The abstract has been amended to include a concise statement of the technical disclosure of the various embodiments of the invention, specifically that which is new in the art. Accordingly, for the reasons stated above, Applicants respectfully request the objection to the abstract be withdrawn.

The objection to Claims 24-26 is respectfully traversed. Claims 24-26 have been amended to dependent from Claim 23. Accordingly, for the reasons stated above, Applicants respectfully request the objection to the specification be withdrawn.

The rejection of Claims 1, 3, 6, 14-22, 27-29, and 31 under 35 U.S.C. § 102(e) as being anticipated by Carroll et al. (U.S. Patent No. 6,687,333) "Carroll" is respectfully traversed.

Carroll describes a system for generating tunable pulsed monochromatic X-rays that may be used to generate CT-like images using a rotating mosaic crystal "optic" time-of-flight "imaging," and phase contrast images. The system includes a tabletop laser emitting a light beam that is counter-propagated against an electron beam produced by a linear accelerator. X-ray photon pulses are generated by inverse Compton scattering that occurs as a consequence of the "collision" that occurs between the electron beam and IR photons generated by the laser. Notably, Carroll does not describe a gantry or an x-ray source rotatable about a patient.

Claim 1 recites a method for obtaining data including "scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire data, the MECT including an x-ray source rotatable about the patient."

Carroll does not describe nor suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 1. Specifically, Carroll does not describe nor suggest a Multi-

Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun. A "collision" between the electron beam from the linear accelerator and the IR photons from the laser generates X-ray photons by inverse Compton scattering. A beam alignment sub-system positioned at a laser beam-electron beam interaction zone directs the X-ray beam through a beryllium window and onto mosaic crystals which divert the beam into a beam transport system toward the imaging target. Accordingly, and for at least the reasons set forth above, Claim 1 is submitted to be patentable over Carroll.

Claims 3, 6, and 14-22 depend from independent Claim 1. When the recitations of Claims 3, 6, and 14-22 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 3, 6, and 14-22 likewise are patentable over Carroll.

Claim 27 recites a Multi-Energy Computed Tomography (MECT) System including "a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of at least one of a head of the patient and a neck of the patient; receive data regarding a second energy spectrum of the scan; and generate a location of a tagging ligand based upon the received data."

Carroll does not describe nor suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 27. Specifically, Carroll does not describe nor suggest a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun, and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals which divert the beam into a beam transport system toward the imaging target. As such, Carroll does not describe nor suggest the claimed elements of the present invention. Accordingly, Claim 27 is submitted to be patentable over Carroll.

Claim 28 recites a Multi-Energy Computed Tomography (MECT) System including "a radiation source rotatable about a patient; a radiation detector; and a computer coupled to

said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of at least one of a head of the patient and a neck of the patient; receive data regarding a second energy spectrum of the scan; and detect a labeled drug based upon the received data.”

Carroll does not describe nor suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 28. Specifically, Carroll does not describe nor suggest a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun, and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals which divert the beam into a beam transport system toward the imaging target. As such, Carroll does not describe nor suggest the claimed elements of the present invention. Accordingly, Claim 28 is submitted to be patentable over Carroll.

Claim 29 recites a Multi-Energy Computed Tomography (MECT) System including “a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of the scan; generate a location of a tagged ligand with an affinity to a neurotransmitter released by a specific labeled drug's receptors based upon the received data; and detect a labeled drug based upon the received data to simultaneously monitor the labeled drug's distribution and a concentration of the neurotransmitter.”

Carroll does not describe nor suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 29. Specifically, Carroll does not describe nor suggest a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun, and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals which divert the beam into a beam transport system toward the imaging target. As such, Carroll does not

describe nor suggest the claimed elements of the present invention. Accordingly, Claim 29 is submitted to be patentable over Carroll.

Claim 31 recites a Multi-Energy Computed Tomography (MECT) System including “a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of the scan; and classify tissue as cancerous and non-cancerous based upon the received data.”

Carroll does not describe nor suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 31. Specifically, Carroll does not describe nor suggest a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun, and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals which divert the beam into a beam transport system toward the imaging target. As such, Carroll does not describe nor suggest the claimed elements of the present invention. Accordingly, Claim 31 is submitted to be patentable over Carroll.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1, 3, 6, 14-22, 27-29, and 31 be withdrawn.

The rejection of Claims 7-9 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Carroll et al. (U.S. Patent No. 6,687,333) “Carroll) in view of Fessler (U.S. Patent No. 6,754,298) is respectfully traversed.

Carroll is described above. Fessler describes a reconstruction method for a polyenergetic scan wherein both the spatial and energy dependencies are parameterized using basis functions that do not require separability in the spatial and energy dimensions and yields a system of equations in the line integrals through the spatial basis functions. The equations are solved numerically in sinogram space, and FBP reconstruction is performed to form images of the material components.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Carroll is cited for describing the use of a multi-energy CT system to obtain information pertaining to abnormalities in the head and neck region including data to characterize plaque in the carotid arteries and Fessler is merely cited for its teaching of a multi-energy CT system to acquire data and perform a Basis Material Decomposition (BMD) of the acquired data. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that Carroll and Fessler teach away from each other and the present invention. Carroll describes a system for generating

tunable pulsed monochromatic X-rays and Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity i.e., a set of two or more energy spectra. Applicants respectfully submit it would not be obvious to use a method for reconstructing images from transmission measurements having energy diversity with a system that generates tunable pulsed monochromatic X-rays. Accordingly, Applicants submit Carroll and Fessler teach away from each other and the present invention.

Moreover, neither Carroll nor Fessler, considered alone or in combination, describe or suggest the claimed invention. Specifically, Claim 1 recites a method for obtaining data including “scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire data, the MECT including an x-ray source rotatable about the patient.”

Neither Carroll nor Fessler, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 1. Specifically, no combination of Carroll and Fessler, describes or suggests a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals and Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity. Accordingly, and for at least the reasons set forth above, Claim 1 is submitted to be patentable over Carroll in view of Fessler.

Claims 7-9 depend from independent Claim 1. When the recitations of Claims 7-9 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 7-9 likewise is patentable over Carroll in view of Fessler.

Claim 30 recites a Multi-Energy Computed Tomography (MECT) System including “a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a

second energy spectrum of the scan; and perform a Basis Material Decomposition (BMD) of the received data to characterize a plaque in a carotid artery.”

No combination of Carroll and Fessler describes or suggests the combination recited in Claim 30. Specifically, Applicant respectfully submits that no combination of Carroll and Fessler describes or suggests a multi-energy computed tomography system that includes a radiation source rotatable about a patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals and Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity. Accordingly, and for at least the reasons set forth above, Claim 30 is submitted as patentable over Carroll in view of Fessler.

For the reasons set forth above, Applicants request that the Section 103 rejection of Claims 7-9 and 30 be withdrawn.

The rejection of Claims 10-13 and 24-26 under 35 U.S.C. § 103(a) as being unpatentable over Carroll et al. (U.S. Patent No. 6,687,333) “Carroll) in view of Fessler (U.S. Patent No. 6,754,298) and further in view of Leuchter et al. (U.S. Patent No. 5,269,315) “Leuchter” is respectfully traversed.

Carroll and Fessler are described above. Leuchter describes a method of analyzing electroencephalographic information to assess brain lesions, characterize afflictions such as dementia, Alzheimer's disease, Pick's disease and demyelinating diseases such as multiple sclerosis using a determination of the electrical output of a brain region by obtaining first data representative of energy in the brain region in a primary frequency domain and determining second data representative of energy in the primary frequency domain relative to the energy in a secondary frequency domain.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP

2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Carroll is cited for describing the use of a multi-energy CT system to obtain information pertaining to abnormalities in the head and neck region including data to characterize plaque in the carotid arteries, Fessler is cited for its teaching of a multi-energy CT system to acquire data and perform a Basis Material Decomposition (BMD) of the acquired data, and Leuchter is cited for obtaining information pertaining to brain lesions and diseases such as mild dementia and Alzheimer’s Disease. Leuchter determines brain lesions by quantified electroencephalography and does not describe or suggest using a multi-energy computed tomography system to acquire the data. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

If art “teaches away” from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that Carroll and Fessler teach away from each other, Leuchter, and the present invention. Carroll describes a system for

generating tunable pulsed monochromatic X-rays and Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity i.e., a set of two or more energy spectra. Applicants respectfully submit it would not be obvious to use a method for reconstructing images from transmission measurements having energy diversity with a system that generates tunable pulsed monochromatic X-rays. Moreover, Leuchter determines brain lesions by quantified electroencephalography, which is not an imaging system and does not use an x-ray source or an x-ray detector. Accordingly, Applicants submit Carroll and Fessler teach away from each other, Leuchter, and the present invention.

Moreover, none of Carroll, Fessler, or Leuchter, considered alone or in combination, describe or suggest the claimed invention. Specifically, Claim 1 recites a method for obtaining data including “scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire data, the MECT including an x-ray source rotatable about the patient.”

None of Carroll, Fessler, nor Leuchter, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 1. Specifically, no combination of Carroll, Fessler, and Leuchter, describes or suggests a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals, Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity, and Leuchter describes determining brain lesions by quantified electroencephalography. Accordingly, and for at least the reasons set forth above, Claim 1 is submitted to be patentable over Carroll in view of Fessler and further in view of Leuchter.

Claims 10-13 depend from independent Claim 1. When the recitations of Claims 10-13 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 10-13 likewise is patentable over Carroll in view of Fessler and further in view of Leuchter.

Claim 23 recites a Multi-Energy Computed Tomography (MECT) System including “a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of a scan of the head; generate an image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient; and calculate a mean transit time of the cerebral blood flow based on the received data.”

No combination of Carroll, Fessler, and Leuchter describes or suggests the combination recited in Claim 23. Specifically, Applicant respectfully submits that no combination of Carroll, Fessler, and Leuchter describes or suggests a multi-energy computed tomography system that includes a radiation source rotatable about a patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals, Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity and Leuchter describes determining brain lesions by quantified electroencephalography. Accordingly, and for at least the reasons set forth above, Claim 23 is submitted as patentable over Carroll in view of Fessler and further in view of Leuchter.

Claims 24-26 depend from independent Claim 23. When the recitations of Claims 24-26 are considered in combination with the recitations of Claim 23, Applicants submit that dependent Claims 24-26 likewise is patentable over Carroll in view of Fessler and further in view of Leuchter.

For the reasons set forth above, Applicants request that the Section 103 rejection of Claims 10-13 and 24-26 be withdrawn.

The rejection of Claims 2, 4, 5, 23, and 24 under 35 U.S.C. § 103(a) as being unpatentable over Carroll et al. (U.S. Patent No. 6,687,333) “Carroll) in view of Wintermark et al. (U.S. Patent No. 6,792,302) “Wintermark” is respectfully traversed.

Carroll is described above. Wintermark describes a method of obtaining measurements of the cerebral blood flow and cerebral blood volume of the brain of a stroke

patient using perfusion CT for quantitative assessment of cerebral blood flow (CBF), mean transit time (MMT) and cerebral blood volume (CBV) of brain tissue to determine if a stroke patient is a candidate for thrombolysis therapy.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Carroll is cited for describing the use of a multi-energy CT system to obtain information pertaining to cerebral blood flow and Wintermark is merely cited for its teaching of a perfusion CT system to determine cerebral blood flow (CBF) and mean transit time. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed

invention. More specifically, Applicants respectfully submit that Carroll and Wintermark teach away from each other and the present invention. Carroll describes a system for generating tunable pulsed monochromatic X-rays and Wintermark describes a method for determining cerebral blood flow (CBF), mean transit time (MMT) and cerebral blood volume (CBV) of brain tissue using perfusion CT. Applicants respectfully submit it would not be obvious to use a perfusion CT system with a system that generates tunable pulsed monochromatic X-rays. Accordingly, Applicants submit Carroll and Wintermark teach away from each other and from the present invention.

Moreover, neither Carroll nor Wintermark, considered alone or in combination, describe or suggest the claimed invention. Specifically, Claim 1 recites a method for obtaining data including “scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire data, the MECT including an x-ray source rotatable about the patient.”

Neither Carroll nor Wintermark, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 1. Specifically, no combination of Carroll and Wintermark, describes or suggests a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals and Wintermark describes using perfusion CT for quantitative assessment of cerebral blood flow (CBF), mean transit time (MMT) and cerebral blood volume (CBV) of brain tissue. Accordingly, and for at least the reasons set forth above, Claim 1 is submitted to be patentable over Carroll in view of Wintermark.

Claims 2, 4, and 5 depend from independent Claim 1. When the recitations of Claims 2, 4, and 5 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2, 4, and 5 likewise is patentable over Carroll in view of Wintermark.

Claim 23 recites a Multi-Energy Computed Tomography (MECT) System including “a radiation source rotatable about a patient; a radiation detector; and a computer coupled to

said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of a scan of the head; generate an image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient; and calculate a mean transit time of the cerebral blood flow based on the received data.”

Neither Carroll nor Wintermark, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 23. Specifically, no combination of Carroll and Wintermark, describes or suggests a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals and Wintermark describes using perfusion CT for quantitative assessment of cerebral blood flow (CBF), mean transit time (MMT) and cerebral blood volume (CBV) of brain tissue. Accordingly, and for at least the reasons set forth above, Claim 23 is submitted to be patentable over Carroll in view of Wintermark.

Claim 24 depends from independent Claim 23. When the recitations of Claim 24 are considered in combination with the recitations of Claim 23, Applicants submit that dependent Claim 24 likewise is patentable over Carroll in view of Wintermark.

For the reasons set forth above, Applicants request that the Section 103 rejection of Claims 2, 4, 5, 23, and 24 be withdrawn.

The rejection of Claim 25 under 35 U.S.C. § 103(a) as being unpatentable over Carroll et al. (U.S. Patent No. 6,687,333) “Carroll” in view of Wintermark et al. (U.S. Patent No. 6,792,302) “Wintermark” and further in view of Fessler (U.S. Patent No. 6,754,298) is respectfully traversed.

Carroll, Wintermark, and Fessler are described above.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As the Federal Circuit has recognized, obviousness is not

established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Carroll is cited for describing the use of a multi-energy CT system to obtain information pertaining to cerebral blood flow, Wintermark is cited for its teaching of a perfusion CT system to determine cerebral blood flow (CBF) and mean transit time, and Fessler is cited for its teaching of a multi-energy CT system to acquire data and perform a Basis Material Decomposition (BMD) of the acquired data. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that Carroll and Wintermark teach away from each other and the present invention. Carroll describes a system for generating tunable pulsed monochromatic X-rays, Wintermark describes a method for

determining cerebral blood flow (CBF), mean transit time (MMT) and cerebral blood volume (CBV) of brain tissue using perfusion CT, and Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity i.e., a set of two or more energy spectra. Applicants respectfully submit it would not be obvious to use a method for reconstructing images from transmission measurements having energy diversity with a system that generates tunable pulsed monochromatic X-rays and would not be obvious to use a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system that directs the X-ray beam through a beryllium window and onto mosaic crystals to perform a perfusion CT scan. Accordingly, Applicants submit Carroll teaches away from Wintermark, Fessler, and the present invention.

Moreover, none of Carroll, Wintermark, and Fessler considered alone or in combination, describe or suggest the claimed invention. Specifically, Claim 23 recites a Multi-Energy Computed Tomography (MECT) System including “a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of a scan of the head; generate an image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient; and calculate a mean transit time of the cerebral blood flow based on the received data.”

None of Carroll, Wintermark, and Fessler, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 23. Specifically, no combination of Carroll, Wintermark, and Fessler, describes or suggests a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals, Wintermark describes using perfusion CT for quantitative assessment of cerebral blood flow (CBF), mean transit time (MMT) and cerebral blood volume (CBV) of brain tissue, and Fessler describes a method for statistically reconstructing images from a

plurality of transmission measurements having energy diversity. Accordingly, for at least the reasons set forth above, Claim 23 is submitted to be patentable over Carroll in view of Wintermark and further in view of Fessler.

Claim 25 depends from independent Claim 23. When the recitations of Claim 25 are considered in combination with the recitations of Claim 23, Applicants submit that dependent Claim 25 likewise is patentable over Carroll in view of Wintermark and further in view of Fessler.

For the reasons set forth above, Applicants request that the Section 103 rejection of Claim 25 be withdrawn.

The rejection of Claim 26 under 35 U.S.C. § 103(a) as being unpatentable over Carroll et al. (U.S. Patent No. 6,687,333) “Carroll” in view of Wintermark et al. (U.S. Patent No. 6,792,302) “Wintermark” and further in view of Fessler (U.S. Patent No. 6,754,298) and further in view of Leuchter et al. (U.S. Patent No. 5,269,315) “Leuchter” is respectfully traversed.

Carroll, Wintermark, Fessler, and Leuchter are described above.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levensgood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such

reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Carroll is cited for describing the use of a multi-energy CT system to obtain information pertaining to cerebral blood flow, Wintermark is cited for its teaching of a perfusion CT system to determine cerebral blood flow (CBF) and mean transit time, Fessler is cited for its teaching of a multi-energy CT system to acquire data and perform a Basis Material Decomposition (BMD) of the acquired data, and Leuchter is cited for obtaining information pertaining to brain lesions and diseases such as mild dementia and Alzheimer's Disease. Leuchter determines brain lesions by quantified electroencephalography and does not describe or suggest using a multi-energy computed tomography system to acquire the data. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that Carroll and Wintermark teach away from each other and the present invention. Carroll describes a system for generating tunable pulsed monochromatic X-rays, Wintermark describes a method for determining cerebral blood flow (CBF), mean transit time (MTT) and cerebral blood volume (CBV) of brain tissue using perfusion CT, and Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity i.e., a set of two or more energy spectra. Applicants respectfully submit it would not be obvious to use a method for reconstructing images from transmission measurements having energy diversity with a system that generates tunable pulsed monochromatic X-rays and would not be obvious to use a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system that directs the X-ray beam through a beryllium window and onto mosaic crystals to perform a perfusion CT scan. Moreover, Leuchter determines brain lesions by quantified electroencephalography, which is not an imaging system and does not use an x-ray source or

an x-ray detector. Accordingly, Applicants submit Carroll teaches away from Wintermark, Fessler, Leuchter, and the present invention.

Moreover, none of Carroll, Wintermark, Fessler, and Leuchter considered alone or in combination, describe or suggest the claimed invention. Specifically, Claim 23 recites a Multi-Energy Computed Tomography (MECT) System including “a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of a scan of the head; generate an image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient; and calculate a mean transit time of the cerebral blood flow based on the received data.”

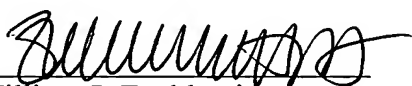
None of none of Carroll, Wintermark, Fessler, and Leuchter, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system including an x-ray source rotatable about the patient as recited in Claim 23. Specifically, no combination of Carroll, Wintermark, Fessler, and Leuchter, describes or suggests a Multi-Energy Computed Tomography system including an x-ray source rotatable about the patient. Rather, in contrast to the present invention, Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals, Wintermark describes using perfusion CT for quantitative assessment of cerebral blood flow (CBF), mean transit time (MMT) and cerebral blood volume (CBV) of brain tissue, Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity, and Leuchter describes determining brain lesions by quantified electroencephalography.. Accordingly, for at least the reasons set forth above, Claim 23 is submitted to be patentable over Carroll in view of Wintermark, in view of Fessler, and further in view of Leuchter.

Claim 26 depends from independent Claim 23. When the recitations of Claim 26 are considered in combination with the recitations of Claim 23, Applicants submit that dependent Claim 26 likewise is patentable over Carroll in view of Wintermark, in view of Fessler, and further in view of Leuchter.

For the reasons set forth above, Applicants request that the Section 103 rejection of Claim 25 be withdrawn.

In view of the foregoing remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully requested.

Respectfully Submitted,



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